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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/613,327	07/03/2003	Daniel M. Kinzer	IR-2143 (2-3569)	4291

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EXAMINER

PERKINS, PAMELA E

ART UNIT PAPER NUMBER

2822

DATE MAILED: 07/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/613,327

Applicant(s)

KINZER ET AL.

Examiner

Pamela E Perkins

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 July 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

This office action is in response to the filing of the application papers on 3 July 2003. Claims 1-17 are pending.

Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "25" has been used to designate both pedestal and gate oxide; see paragraph 18, page 4, lines 5 and 6. Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the

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applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 3, 7, 8, 11-13 and 17 are rejected under 35 U.S.C. 102(e) as being anticipated by Onishi et al. (6,611,021).

Onishi et al. disclose a process for the manufacture of a substrate for a superjunction device where a first epitaxial semiconductor layer (2a) of a given thickness and of a given impurity concentration of a first conductivity type is formed atop a support body (1); forming a plurality of laterally spaced implants (7) of a second conductivity type on the surface of the first epitaxial layer (2a) at vertically interior locations (Fig. 5c); forming a second epitaxial layer (2b) of a given thickness and of a given concentration and of the first conductivity type atop the first layer (2a) (col. 12, lines 33-63); heating the substrate (1) and the implants (7) to cause the implants (7) to diffuse downwardly into the first layer (2a) and upwardly into the second layer (2b), thereby forming spaced pedestals (58b) of the second conductivity type within the first and second layers (2a, 2b) (col. 8, lines 11-61); the total charge of each of the pedestals (58b) being approximately equal to the total charge in the volume of the first and second layers (2a, 2b) which surrounds the pedestals (58b) (col. 13, lines 38-65); and thereafter forming MOSgated cell elements atop (16) each of the pedestals (58b). Onishi et al. further disclose the first and second layers (2a, 2b) having the same thickness and impurity concentration and the support layer (1) having the same conductivity type as the first and second layers (2a, 2b) (col. 9, lines 15-36). Onishi et al. also disclose forming a drain electrode (18) on the bottom of the support layer (1), and separating the

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support layer (1) and the MOSgated cell elements (16) into separate unitary elements (col. 7, lines 20-51).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2, 4-6, 9, 10 and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Onishi et al. in view of Gardner et al. (6,204,153).

Onishi et al. disclose the subject matter claimed above except the first and second layers being silicon and the support body as a silicon wafer.

Gardner et al. disclose a process for the manufacture of a substrate for a semiconductor device where a first epitaxial semiconductor layer (12) of a given thickness and of a given impurity concentration of a first conductivity type is formed atop a support body (10); forming a second epitaxial layer (14) of a given thickness and of a given concentration and of the first conductivity type atop the first layer (12) (col. 6, lines 25-64); forming an implant (26) of a second conductivity type on the surface of the first layer (12) (col. 8, lines 7-62); and thereafter forming a MOSgated cell element (30) atop of the implant (26) (col. 9, lines 6-53). Gardner et al. further disclose the first and second layers (12, 14) being silicon and the support body (10) as a silicon wafer (col. 6, lines 25-64).

Since Onishi et al. and Gardner et al. are both from the same field of endeavor, a process for the manufacture of a substrate for a semiconductor device, the purpose disclosed by Gardner et al. would have been recognized in the pertinent art of Onishi et al. Therefore, it would have been obvious to one ordinary skill in the art at the time the invention was made to modify Onishi et al. by the first and second layers being silicon and the support body as a silicon wafer as taught by Gardner et al. to reduce punchthrough (col. 3, lines 17-34).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pamela E Perkins whose telephone number is (571) 272-1840. The examiner can normally be reached on Monday thru Friday, 9:00am to 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on (571) 272-1852. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PEP



Michael Trinh
Primary Examiner
Art S/E